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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,973	12/03/2001	Herbert J. Hedberg	HKI-110XX	7813

207 7590 09/05/2003

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EXAMINER	
STARSIAK, JOHN S	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 09/05/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/004973	Applicant(s) Herbert Hedberg et al.
	Examiner J. STARSIAK	Group Art Unit 1753

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☑ Responsive to communication(s) filed on 03 December 2001.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-67 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☑ Claim(s) 1-4, 13-16, 32-39, and 67 is/are allowed.

☒ Claim(s) 5-12, 17-31, 40-43, 45, 48, and 50-66 is/are rejected.

☒ Claim(s) 44, 46, 47, and 49 is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other _____

Office Action Summary

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the pair of electrodes disposed on the docking station recited in claim 67 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5-12, 17-31, 41, 50-59, and 60-66 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites, "the system of claim 1, further comprising a pipette wash station". There is no pipette recited in claim 1. Claim 6 recites, "said pipette". There is no antecedent basis for

this recitation in claim 4, upon which this claim depends. It appears that "said pipette" corresponds to "a microfluidic pipette" recited in claim 4. Claim 7 recites, "The system of claim 1, further comprising a plurality of detector modules...". The underlined portion of this recitation is alternative structure to the structure recited in claim 1, i.e. "A detector module". In other words claim 7 should recite, "further comprising additional detector modules". Claim 9 recites, "...a portion of the glass tubing free of the polyimide coating in a location to form a window in alignment with the detector on the detector module.". This recitation is indefinite for two reasons. First, from the specification "the portion" of claim 9 appears to correspond to "a portion of said capillary" recited in claim 1. Hence, it appears that "the portion" recited in claim 9 is a double recitation. Second, how can "the detector" be on "the detector module" when in claim 1 the detector is recited as an element of "the detector module". Claim 10 recites, "a removable cartridge component". This recitation raises the obvious question, i.e. removable from what? From the specification "the removable cartridge component is not "removable" from any of the elements of the detection module recited in claim 1. Claim 11 recites, "the detector module further comprises a latch mechanism configured to retain the removable cartridge component to an upper housing". Since "an upper housing" is an element of the detector module the claims should clearly recite is fact. Claim 12 recites, "wherein the upper housing is movably attached to the base.". This recitation is indefinite for several reasons. What is meant by the phrase "movably attached" is incomprehensible. How can the upper housing be both "attached" to the base and "movable" relative to the base? Second, the recitation recites no structure to perform the

"movable attachment". It is well-established that apparatus must be claimed by "what they are" and not "what they do". Third, from the specification it is unclear what is meant by the phrase "movably attached". Claim 17 recites, "the plurality of working wells". There is no antecedent basis for this recitation in claim 1. Does "the plurality of working wells" correspond to the "plurality of wells recited in claim 1? Claim 24 recites, "the arm assembly further comprises...". Since no structural elements of the arm assembly are recited in claim 1, the proper recitation is "the arm assembly comprises". Similarly, claim 28 recites, "the arm assembly further comprises...". Claim 41 recites , " an ultraviolet detector". It appears that the term "absorbance" is missing, i.e. see claim 2. Claim 50 recites, "The detector module of claim 42, further comprising an input optical fiber...to direct light through the capillary at an acute angle to an axial extent of the capillary". What is meant by the underlined term is incomprehensible. MPEP 608.01(o) states: "The meaning of every term used in any of the claims should be apparent from the descriptive portion of the specification with clear disclosure as to its import; and in mechanical cases, it should be identified in the descriptive portion of the specification by reference to the drawing designating the part or parts therein to which the term applies." Similarly, claim 54 recites, "an angle of light collection from the capillary". This term is not defined or even used in the written description of the invention. Claim 52 recites, further comprising a chamber disposed in the housing on an opposite of the capillary...". This recitation is indefinite for two reasons. First, there appears to be a word(s) missing after opposite. Second, the structure intended by this recitation is unclear, e.g. the term "chamber" cannot be found in the written description of the

invention. Claim 53 recites, "The detector module of claim 42, further comprising an input excitation light path...". This recitation is indefinite because there is no recitation of structure. In other words, for there to be an input excitation light path, a excitation light source, associated optics (if any), and structural relationships between this elements and other elements of the detector module (e.g. the capillary) must be recited. Claim 53 also recites, "an excitation light axis" and "a collection optical axis". Neither of these terms are physical structure". It is well-established that apparatus claims must distinguish over the prior art by positive recitations of structure. Claim 56 recites, "wherein the optical collection assembly further comprises...". Claim 58 recites, "wherein the optical collection assembly further comprises...". The use of the term "further" in each of these claims is improper because no structure of the collection optical assembly is recited in claim 53, upon which each of these claims depends. Claim 59 recites, "The detector module of claim 42,...the axis of the collection assembly.". This recitation does not have proper antecedent basis since there is no collection assembly recited in claim 42. Claim 64 recites, "a removable portion of the housing". This recitation raises the obvious question, i.e. removable from what?. There are no structure details of the housing in claims 40,41, and 60 upon which this claim depends. Claim 66 recites, "the housing further includes a removable cartridge...". This recitation is indefinite for two reasons. First since no detailed structure of the housing are recited in claim 40, the use of the term further is improper. Second, the recitation raises the question, i.e. removable from what? The remaining claims are rejected because they depend on one or more of the above claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 40, 41, 43, 45, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burolla et al. in view of Zimmermann.

Regarding claim 40, Burolla et al. discloses a cartridge for capillary electrophoresis comprising; a housing [the block of boron nitride illustrated in FIG. 3, 4B, and 7] having a channel [spiral path S] therethrough; a capillary [Q] disposed in the channel in the housing, the inlet and outlet end of the capillary depending from said housing; and a detector disposed in alignment with a portion of the capillary [col. 1, lines 19-22: "In this type of electrophoresis...sample is injected at one end of the capillary. A detector is registered to a point on the capillary typically to the other end of the capillary distant from the sample]. Regarding claim 41, Burolla et al. teaches [col. 3, lines 57-62]: "Yet another advantage of the cartridge is that it readily accommodates all types of detection currently used in electrophoresis. Resistance detection, light absorption, fluorescent detection, Schlieren effect detection and mass spectroscopy can all be used." Burolla et al. teaches [col. 6, lines 41 and 42]: "... in one embodiment used for UV adsorption detection...". Regarding claims 43 and 45, Burolla et al.

teaches [col. 4, lines 56-61]: "An advantage of this aspect is that when the cartridge is in use, cooling of the capillary against electric resistance heating can occur. Simply stated, the boron nitride cartridge is registered at at least one side to a "heat sink"-such as a pure aluminum block of metal. This block is preferably cooled". Claim 48 recites, wherein detector module comprising a mechanism *to be* lifted by an arm assembly of a capillary electrophoresis system. This limitation reads on Burolla et al. for three reasons. First, it is a conditional limitation. Second, the structure of the "mechanism" depends of the structure of the arm, which is not claimed. Third, given the almost infinite possible clamping/gripping mechanisms used by a robotic arm, the mechanism reads on several elements of the cartridge of Burolla et al., e.g. the sides of the cartridge. Hence the only difference between the claims is that claim 40 recites "a first electrode depending from the housing and a second electrode depending from the housing" and Burolla et al. does not explicitly teach "a first electrode depending from the housing and a second electrode depending from the housing". However, Burolla et al. does teach [col. 1, lines 22-27]: "An electropotential is applied to the capillary between the respective distal ends thereof. This electropotential is commonly applied by dipping each distal end of the capillary in a separate vial of electrolyte, with each vial at a different electric potential." Zimmermann discloses a capillary electrophoresis cartridge similar to the type disclosed Burolla et al. Zimmermann discloses electrodes depending form the housing. Specifically, Zimmermann teaches [col. 6, lines 40-52]: "In the following, the sealing and electrode arrangement will be described in more detail with reference to FIGS. 4 and 5. FIG. 4 shows a cross section through a part of the apparatus shown in FIG. 3 comprising the

sealing and electrode arrangement 36...the arrangement 36 comprises a tube 39 of electrically conductive material which serves as an electrode. The inner diameter of electrode tube 39 is selected such that the capillary 1 can be pushed through it.". It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the cartridge of Burolla et al. with electrodes such as those taught by Zimmermann because electrodes are necessary for the cartridge of Burolla et al. to perform its intended function, i.e. capillary electrophoresis.

Claims 40, 42, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burolla et al in view of Weinberger et al.

Regarding claim 40 Burolla et al. discloses a cartridge for capillary electrophoresis comprising: a housing [the block of boron nitride illustrated in FIG. 3, 4B, and 7] having a channel [spiral path S] therethrough; a capillary [Q] disposed in the channel in the housing, the inlet and outlet end of the capillary depending from said housing; and a detector disposed in alignment with a portion of the capillary [col. 1, lines 19-22, " In this type of electrophoresis...sample is injected at one end of the capillary. A detector is registered to a point on the capillary typically to the other end of the capillary distant from the sample]. Regarding claim 42, Burolla et al. teaches [col. 3, lines 57-62]: "Yet another advantage of the cartridge is that it readily accommodates all types of detection currently used with electrophoresis. Resistance detection, light adsorption, *fluorescent detection*, Schlieren effect detection and mass spectroscopy can all be used." Regarding claim 53, Burolla et al. teaches [col. 7, lines 2-12]: "the reader will understand that the particular detector scheme utilized at aperture D may vary. In the

particular detector scheme in FIG. 1, a protruding cylinder 80 registers the cartridge to detector apparatus (not shown). A detector aperture 82 holds a fiber optic 86 to abut the capillary Q. Light passing through the fiber optic is incident on the capillary. The light fluoresces the bands of material isolated by electrophoresis. Light passes out of the detection region outer housing 16 to the detector (not shown). The only difference between claim 40 and Burolla et al is that claim 40 recites "a first electrode depending from the housing and a second electrode depending from the housing" and Burolla et al. is silent concerning electrodes. However, Burolla et al. teaches [col. 1, lines 22-27]: "An electropotential is applied by dipping each distal end of the capillary in a separate vial of electrolyte, with each vial at a different electric potential." Weinberger et al. discloses a capillary electrophoresis cartridge of the type disclosed in Burolla et al. Weinberger et al. discloses electrodes depending from the housing. Specifically, Weinberger et al. [col. 6, lines 41-48]: " An air cooled cartridge 130 (see FIG. 4) is used for capillary electrophoresis in accordance with the invention. Cartridge 130 consists: of a main body 146; a bobbin assembly 148; a spherical lens holder assembly 150; metallic electrodes 152,154; electrical contacts 156,158; and capillary tubing 162 of glass, quartz, or teflon, typically no greater than 500 microns inside diameter and about 1- to 200 cm. long.". It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the cartridge of Burolla et al. with electrodes such as those taught by Weinberger et al. because electrodes are necessary for the cartridge of Burolla et al. to perform its intended function, i.e. capillary electrophoresis. The only difference between claim 42 and 53 is that claims 42 and 53 recite "a laser induced fluorescence detector"

and Burolla et al. teaches only "fluorescent detection". The use of a laser as the light source in fluorescent detection is notoriously well-known in art Weinberger et al. is one of numerous references which disclose this teaching. Specifically Weinberger et al. teaches [col. 9, lines 26-53]: "The monochromator may be generating light of a given bandwidth for the purpose of UV-visible photometric adsorbance detection, fluorescence detection, refractive index detection, as well as other means of photometric detection. Light may also be focused into fiber optic bundle 262 from a coherent light source (*laser*) for the purpose of refractive index, *fluorescence*, thermal-optical-density detection, as well as other means of coherent light photometric detection.". It would have been obvious to one of ordinary skill in the art at the time of the invention to use a laser as the light source in combination with Burolla et al. because lasers are notoriously well-known as light sources in fluorescent detectors for capillary electrophoresis.

Claims 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burolla et al. in view of Weinberger et al. as applied to claim 42 above, and further in view of Merenkova et al or Yeung et al. or Melman et al.

Claims 50 is rejected insofar as it is definite. Burolla et al. teaches that interfacing known detectors for electrophoresis to their capillary cartridge is within the abilities of one skilled in the art. Specifically, Burolla et al. teaches [col. 3, lines 57-61]: "Yet another advantage of the cartridge is that it readily accommodates all types of detection currently utilized with electrophoresis. Resistance detection, light adsorption, fluorescent detection, Schlieren effect

detection and mass spectroscopy can all be used". Each of the secondary references disclose laser induced fluorescent detectors with the structural limitations recited in claim 50. Specifically, Yeung et al. teaches [col.3, lines 28-33]: "The present invention provides a fluorescent detection system for capillary electrophoresis wherein a laser can be used to substantially simultaneously excite fluorescence in multiple capillaries...". Yueng et al. teaches [col. 8, lines 23 -45]: "Although the preferred embodiment is to irradiate the sample axially, a viable application of the present invention is to irradiate orthogonally, i.e. perpendicular to the capillary length. The illuminating ends of the optical fiber 15 are located on the opposite side of the array 102 of capillaries 20 in relation to the microscope 60 and the camera 50. Optical fibers 15 are again coupled individually to the capillaries 20. FIG. 3 (not to scale) illustrates this scheme. Camera 50 (not shown) is coupled to microscope objective 65... Although 45° is preferred, the angle of incident light on the surface of the capillary 20 can be varied as care is taken to reduce stray laser light from interfering with the fluorescent light as detected by the camera." Specifically, Merenkova et al. teaches [col. 10, lines 11-21]: "As shown in FIG. 7, the light source 46 comprises a source of laser light 78 analogous to that described above. In this embodiment, laser light may advantageously be routed to the capillary array through an optical fiber. The light source 46 also comprises an appropriate focusing objective lens 70. The detector/synchronization channel 48 includes a microscope 61 analogous to the microscope 60 of the illuminator 36 of FIGS. 3 and 5. The angle between the illuminating light beam and the axis of the light collecting objective is advantageously approximately 45 degrees". Although Merenkova et al. does not

explicitly recite an acute angle between excitation light and the capillary, because of the spatial relationship between the axis of the light collecting objective and the capillary, the above recitation results in an acute angle being formed between the excitation light and the capillary. Melman et al. teaches [col. 3, lines 36-47]: "A mounting structure 150 for the optical fiber system of the present invention is illustrated in connection with FIG. 2. The delivery fibers 16 are mounted onto a precision grooved substrate 14 with an adhesive layer 39. The substrate 14 is mounted onto a mounting element 140 with the fibers extending between the substrate 14 and the first mounting surface of element 140. The collection fibers 15 and the second substrate are similarly mounted on a second mounting surface of element 140. The mounting surface define an angle between 40° and 50° relative to each other, preferably at about 45°.". Hence, it would have been obvious to one of ordinary skill in the art at the time of the invention to interface a laser induced fluorescent detector having the structure of the secondary references with the capillary cartridge of Burolla et al. because detectors with these features are known in the art and Burolla et al. teaches that interfacing known detectors with their capillary cartridge is within the abilities of one of ordinary skill in the art.

Claims 54 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burolla et al. in view of Weinberger et al. as applied to claim 42 and 53 above, and further in view of Stewart.

Burolla et al. teaches that interfacing known detectors used in capillary electrophoresis to their capillary cartridge is within the abilities of one skilled in the art. For details of this teaching

see rejection of claim 50 above. The only difference between Burolla et al. as modified in view Weinberger et al. is that Burolla et al. does not disclose the detailed laser induced fluorescent detection system recited in these claims, i.e. a laser used as the light source and the placement of an objective lens between the separation capillary and the photodetector. The use of lasers as a light source and the placement of an objective lens between the separation capillary and the photodetector are notoriously well-known in the art, i.e. Stewart is one of numerous references which discloses these teachings. Stewart teaches [col.8, lines 18-37]: "In another embodiment of the present invention, at detector system is coupled to the separation system previously described for monitoring the progress of separating a selected molecule from a mixture of molecules. FIG. 8 shows a schematic representation of such a detector system 100...An argon ion laser 108 emits a laser beam 111 (488 nm) that is reflected by a dichroic beam splitter 116 such that the beam passes through an objective lens 120 (Zeiss 63+, 1.4 NA) onto the microchannel of the separation device 104...The fluorescence 124 is collected by the objective lens 120 and focused , and then passed through a bandpass filter 128, and onto a slit in the front of a photomultiplier tube 132.". Hence, it would have been obvious for one of ordinary skill in the art at the time of the invention to interface a laser induced fluorescent detection with the features taught in Stewart with the capillary cartridge of Burolla et al. because detectors with these features are known in the art and Burolla et al. teaches that interfacing known detectors with their capillary cartridge is within the abilities of one with ordinary skill in the art.

Claims 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burolla et al. in view of Weinberger et al as applied to claims 42 and 53 above, and further in view of Shear et al.

Burolla et al. teaches that interfacing known detectors for electrophoresis to their capillary cartridge is within the abilities of one skilled in the art. For details of Burolla et al. see the rejection of claim 50 above. Laser induced fluorescent detectors with interference filters to block excitation light and pass fluorescent light are notorious well known in the art. Shear et al. is one of numerous references which disclose this teaching. Specifically, Shear et al. teaches [col. 17, lines 54-57]: "To minimize collection of background, two or more 10-nm bandpass interference filters...are positioned immediately in front of the collection lens.". Hence, it would have been obvious to one of ordinary skill in the art to interface the capillary cartridge of Burolla et al. with a laser induced fluorescent detector including an interference filter because said detectors are well-known in the art and the interfacing of said detector with the capillary cartridge is within the abilities of one of ordinary skill in the art.

Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burolla et al in view of Weinberger et al. as applied to claims 42 and 53 above, and further in view of Yeung et al.

Burolla et al. teaches that interfacing known detectors for electrophoresis to their capillary cartridge is within the abilities of one skilled in the art. Specifically, Burolla et al. teaches [col.3, lines 57-61]: "Yet another advantage of the cartridge is that it readily accommodates all types of detection currently utilized with electrophoresis. Resistance detection,

light adsorption, fluorescent detection, Schlieren effect detection and mass spectroscopy can be used.". Laser induced fluorescent detectors which including focusing lens are notoriously well-know in the art. Yeung et al. is one of numerous references which disclose this teaching. Specifically, Yeung et al. teaches [claim 5 and 6]: " 5. The detection system of claim 1 further comprising a means for focusing light. 6. The detection system of claim 5 wherein the focusing means is a lens for focusing fluorescent light emitted from the target species in the capillaries to the means for detecting fluorescent light". Hence, it would have been obvious at the time of the invention to interface laser induced fluorescent detectors with the capillary cartridge of Burolla et al. because said detectors are well-known and the interfacing is within the abilities of one of ordinary skill in the art.

Claims 58 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burolla et al. in view Weinberger et al. as applied to claim 42 and 53 above, and further in view of either Stewart or Eriksson et al.

Burolla et al. teaches the interfacing known detectors for electrophoresis to their capillary cartridge is within the abilities of one skilled in the art. Specifically, Burolla et al. teaches [col. 3, lines 57-61]: "Yet another advantage of the cartridge is that it readily accommodates all types of detection currently utilized with electrophoresis. Resistance detection, light adsorption, fluorescent detection, Schlieren effect detection and mass spectroscopy can be used." The use of masks to define slots/slits/pinhole is notoriously well-known in the art. Similarly, the use of photomultiplier tubes as photodetectors is notoriously well-known in the art.

The two secondary references are two of a many references which disclose these teachings. The mask recited in claim 58 reads on the structure which defines "pinhole or slit 13" of Eriksson et al. or structure which define "a slit in front of a photomultiplier tube 132" of Stewart. Specifically, Eriksson et al. teaches [col. 11, lines 47-51]: "Detection is made through a pinhole or slit 13 which serves to spatially reject the out-of plane light. A highly sensitive photon detector 12 such as a single photon counting diode, or photon counting photomultiplier tube is preferably used for detection.". Specifically, Stewart teaches [col. 8, lines 34-37]: "The fluorescent 124 is collected by objective lens 120 and focused, and then passed through a bandpass filter 128, and onto a slit in the front of photomultiplier tube 132.". It would be obvious to one of ordinary skill in the art at the time of the invention to interface the photodetection system of either Stewart or Eriksson et al. with the capillary cartridge of Burolla et al. because the systems are known in the art and the interfacing of these systems is within the abilities of one of ordinary skill in the art.

Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burolla et al in view of either Zimmermann to claim 41 above, and further in view of Carver.

Burolla et al. teaches that interfacing known detectors for electrophoresis with their capillary cartridge is within the abilities of one of ordinary skill in the art. Speciffically, Burolla et al. teaches [col. 3, lines 57-61]: "Yet another advantage of the cartridge is that it readily accommodates all types of detection currently utilized with electrophoresis. Resistance detection, light adsorption, fluorescent detection, Schlieren effect detection and mass spectroscopy can all be used." Carver discloses a detection system comprising an optical fiber 30 in communication

with an ultraviolet light source 26 and having a termination disposed adjacent to the capillary 13 and a photodiode 52 disposed on the opposite side of the capillary in alignment with the termination of the optical fiber. Specifically, Carver teaches [col. 6, lines 25-38]: "Optical array 22, in turn , includes a light source 26, of any suitable wavelength or any combination thereof for producing light at a desired wavelength...Typically, ultraviolet light may be employed for absorption measurements. Light emitted by light source 26 passes into a fiber optic beam splitter 28 comprising a plurality of separate fiber optic strands 30. Each fiber optic strand 30 has a first end 32 which faces the light source to receive light emitted therefrom and second ends 34 opposite first ends 32. Each fiber optic strand 30 has a second end portion 36 which is proximate to second end 34 with second end portions 36 being organized in a common plane. A portion of the capillary tube 13 forms a sample cell 40...". Specifically Carver teaches [col. 6, lines 59-62]: "After passing through sample cell 40, each test component of light corresponding to each fiber optic strand 30 is focused onto a photodetector 52 organized in photodetector array 50". Specifically Carver teaches [col. 5, lines 24-27]: "FIG. 6 is a graph showing the x/y distribution pattern of a test beam of light that is focused on a *photodiode* detector according to the exemplary embodiment of the present invention.". It would have been obvious to one of ordinary skill in the art to interface the photodetector system of Carver with the capillary cartridge of Burolla et al. because the system is known in the art and interfacing said system is within the abilities of ordinary skill in the art.

Allowable Subject Matter

Claims 1-4, 13-16, 32-39 and 67 are allowed. The prior art does not explicitly teach or fairly suggests an automated capillary electrophoresis apparatus in which the separation capillary and the detector are moved by a robotic arm capable of moving in three dimensions. Klein et al. is typical example of an automated capillary electrophoresis. Klein et al. suggests moving the capillaries in a single dimension but not in three dimensions with an arm. Specifically Klein et al. teaches [col. 3, lines 48-55]: "To position the capillaries within the appropriate wells of the reagent segments, the turntable carrying the reagent segments can be elevated toward and away from the first ends of the capillaries. Alternatively, the capillaries may be mounted on a suitable elevator platform that can be lowered and raised to either place the capillary first ends into or remove such ends from respective wells of the reagent segments.".

Claims 5-12 and 17-32 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 44, 46, 47, and 49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John S. Starsiak Jr. whose telephone number is (703) 308-1797. The examiner can normally be reached on Monday-Wednesday from 8:00 AM to 3:30 PM and on Thursday & Friday from 8:00 AM to 12:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on (703) 308-1797. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

John S. Starsiak Jr.

18 August 2003